SEQUENCE LISTINGS

<110>   Hanmi Pharm. Co., Ltd.

<120>   EXPRESSION VECTOR FOR SECRETING ANTIBODY FRAGMENT USING E. COLI SIGNAL
         SEQUENCE AND METHOD FOR MASS-PRODUCING ANTIBODY FRAGMENT

<130>   PCA40739/HMY

<150>   KR1020030072216
<151>   2003-10-16

<160>   36

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<220>
<223>   gene fragment of light chain variable region

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ggggacagag tcacc   .   75

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<212>   DNA
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ggtgactctg tcccctacag   80

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<212>   DNA
<213>   Artificial Sequence

<220>
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tgcaatcagg ggtcccatct   80

<210>   4
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<212>   DNA
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<223>   gene fragment of light chain variable region

<400>   4
aggctgtagg ctgctgatgg tgagagtgaa atctgtccca gatccactgc cactgaaccg   60

agatgggacc cctgattgca   80

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<211>   80
<212>   DNA
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<220>
<223>   gene fragment of light chain variable region

<400>   5
ccatcagcag cctacagcct gaagatgttg caacttatta ctgtcaaagg tataaccgtg   60

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<210>   6
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<212>   DNA
<213>   Artificial Sequence

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<400>   6
tttgatttcc accttggtcc cctggccaaa agtatacggt g   41

<210>   7
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<220>
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<400>   7
gggaagcttc gatcggaggt gcagctggtg gagtctgggg gaggcttggt acagcccggc   60

aggtccctga gactc   75

<210>   8
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<212>   DNA
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<223>   gene fragment of heavy chain variable region

4

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<400>    8
agcttgccgg acccagtgca tggcataatc atcaaaggtg aatccagagg ccgcacagga    60

gagtctcagg gacctgccg                                                 79



<210>    9
<211>    80
<212>    DNA
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<220>
<223>    gene fragment of heavy chain variable region


<400>    9
tgcactgggt ccggcaagct ccagggaagg gcctggaatg ggtctcagct atcacttgga    60

atagtggtca catagactat                                                80



<210>    10
<211>    80
<212>    DNA
<213>    Artificial Sequence

<220>
<223>    gene fragment of heavy chain variable region


<400>    10
atacagggag ttcttggcgt tgtctctgga gatggtgaat cggccctcca cagagtccgc    60

atagtctatg tgaccactat                                                80



<210>    11
<211>    80
<212>    DNA
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<220>
<223>    gene fragment of heavy chain variable region
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<400>   11
acgccaagaa ctccctgtat ctgcaaatga acagtctgag agctgaggat acggccgtat   60

attactgtgc gaaagtctcg   80

<210>   12
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<212>   DNA
<213>   Artificial Sequence

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<400>   12
cactcgagac ggtgaccagg gtaccttggc cccaatagtc aagggaggac gcggtgctaa   60

ggtacgagac tttcgcacag taat   84

<210>   13
<211>   39
<212>   DNA
<213>   Artificial Sequence

<220>
<223>   RT-PCR forward primer specific for heavy chain

<400>   13
cccaagctta ggcctccacc aagggcccat cggtcttcc   39

<210>   14
<211>   48
<212>   DNA
<213>   Artificial Sequence

<220>
<223>   RT-PCR reverse primer specific for heavy chain

6

<400>   14
gggggatcct tatgggcacg gtgggcatgt gtgagttttg tcacaaga   48

<210>   15
<211>   42
<212>   DNA
<213>   Artificial Sequence

<220>
<223>   RT-PCR forward primer specific for light chain

<400>   15
cccaagcttt cgcgaactgt ggctgcacca tctgtcttca tc   42

<210>   16
<211>   42
<212>   DNA
<213>   Artificial Sequence

<220>
<223>   RT-PCR reverse primer specific for light chain

<400>   16
cccggatccc taacactctc ccctgttgaa gctctttgtg ac   42

<210>   17
<211>   69
<212>   DNA
<213>   modified E. coli thermostable enterotoxin II signal sequence

<400>   17
atgaaaaaga caatcgcatt tcttcttgca tctatgttcg ttttttctat tgctacaaat   60

gcccaggcg   69

7

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<210>    18
<211>    45
<212>    DNA
<213>    Artificial Sequence

<220>
<223>    forward primer containing Stul restriction enzyme site


<400>    18
tctattgcta caaatgccca ggccttccca accattccct tatcc                    45


<210>    19
<211>    45
<212>    DNA
<213>    Artificial Sequence

<220>
<223>    reverse primer containing Stul restriction enzyme site


<400>    19
agataacgat gtttacgggt ccggaagggt tggtaaggga atagg                    45


<210>    20
<211>    51
<212>    DNA
<213>    Artificial Sequence

<220>
<223>    reverse primer specific for light chain


<400>    20
gggggatcct cacgcggcgc atgtgtgagt tttgtcacaa gatttaggct c             51


<210>    21
<211>    43
<212>    DNA
<213>    Artificial Sequence
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8

<220>
<223>   forward primer containing SD sequence and BamHl restriction enzyme site

<400>   21
gggggatcca ggaggtgatt tatgaaaaag acaatcgcat ttc   43

<210>   22
<211>   44
<212>   DNA
<213>   Artificial Sequence

<220>
<223>   forward primer containing Bpul restriction enzyme site

<400>   22
ggggctgagc aggaggtgat ttatgaaaaa gacaatcgca tttc   44

<210>   23
<211>   52
<212>   DNA
<213>   Artificial Sequence

<220>
<223>   reverse primer containing Bpul restriction enzyme site

<400>   23
ggggctcagc tcacgcggcg catgtgtgag ttttgtcaca agatttaggc tc   52

<210>   24
<211>   63
<212>   DNA
<213>   E. coli OmpA signal sequence

<400>   24
atgaaaaaga cagctatcgc gattgcagtg gcactggctg gtttcgctac cgttgcgcaa   60

9

gct   63

<210>   25
<211>   30
<212>   DNA
<213>   Artificial Sequence

<220>
<223>   forward primer specific for heavy chain

<400>   25
gaggttcagc tagtcgagtc aggaggcggt   30

<210>   26
<211>   51
<212>   DNA
<213>   Artificial Sequence

<220>
<223>   forward primer containing HindIII and StuI restriction enzyme sites

<400>   26
gggagatctt cacgcggcgc atgtgtgagt tttgtcacaa gatttaggct c   51

<210>   27
<211>   30
<212>   DNA
<213>   Artificial Sequence

<220>
<223>   reverse primer containing stop codon and BamHI restriction enzyme site

<400>   27
gacattcaaa tgacccagag cccatccagc   30

<210>   28

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<211>    42
<212>    DNA
<213>    Artificial Sequence

<220>
<223>    forward primer containing HindIII and NruI restriction enzyme sites


<400>    28
cccagatctc taacactctc ccctgttgaa gctctttgtg ac                    42


<210>    29
<211>    41
<212>    DNA
<213>    Artificial Sequence

<220>
<223>    reverse primer containing stop codon and BamHI restriction enzyme site


<400>    29
ggggtcgaca ggaggtgatt tatgaaaaag acagctatcg c                     41


<210>    30
<211>    51
<212>    DNA
<213>    Artificial Sequence

<220>
<223>    reverse primer containing SalI restriction enzyme site


<400>    30
ggggtcgact cacgcggcgc atgtgtgagt tttgtcacaa gatttaggct c          51


<210>    31
<211>    42
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<213>    Artificial Sequence
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11

<220>
<223>　　forward primer specific for modified E. coli enterotoxin II signal
　　　　　peptide and containing NdeI restriction enzyme site

<400>　　31
gggcatatga aaaagacaat cgcatttctt cttgcatcta tg　　　　　　　　　　　　42

<210>　　32
<211>　　705
<212>　　DNA
<213>　　Artificial Sequence

<220>
<223>　　TNF-alpha heavy chain

<400>　　32
gaggttcagc tagtcgagtc aggaggcggt ttggtacagc ccggcaggtc cctgagactc　　　60

tcctgtgcgg cctctggatt caccttttgat gattatgcca tgcactgggt ccggcaagct　　120

ccagggaagg gcctggaatg ggtctcagct atcacttgga atagtggtca catagactat　　180

gcggactctg tggagggccg attcaccatc tccagagaca acgccaagaa ctccctgtat　　240

ctgcaaatga acagtctgag agctgaggat acggccgtat attactgtgc gaaagtctcg　　300

taccttagca ccgcgtcctc ccttgactat tggggccaag gtaccctggt caccgtctcg　　360

agtgcctcca ccaagggccc atcggtcttc cccctggcac cctcctccaa gagcacctct　　420

gggggcacag cggccctggg ctgcctggtc aaggactact tccccgaacc ggtgacggtg　　480

tcgtggaact caggcgccct gaccagcggc gtgcacacct tcccggctgt cctacagtcc　　540

tcaggactct actccctcag cagcgtggtg accgtgccct ccagcagctt gggcacccag　　600

acctacatct gcaacgtgaa tcacaagccc agcaacacca aggtggacaa gaaagttgag　　660

cccaaatctt gtgacaaaac tcacacatgc ccaccgtgcc catag　　　　　　　　705

12

<210> 33
<211> 645
<212> DNA
<213> Artificial Sequence

<220>
<223> TNF-alpha light chain

<400> 33

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gacatccaga tgacccagtc tccatcctcc ctgtctgcat ctgtagggga cagagtcacc        60

atcacttgtc gggcaagtca gggcatcaga aattacttag cctggtatca gcaaaaacca       120

gggaaagccc ctaagctcct gatctatgct gcatccactt tgcaatcagg ggtcccatct       180

cggttcagtg gcagtggatc tgggacagat ttcactctca ccatcagcag cctacagcct       240

gaagatgttg caacttatta ctgtcaaagg tataaccgtg caccgtatac ttttggccag       300

gggaccaagg tggaaatcaa acgaactgtg gctgcaccat ctgtcttcat cttcccgcca       360

tctgatgagc agttgaaatc tggaactgcc tctgttgtgt gcctgctgaa taacttctat       420

cccagagagg ccaaagtaca gtggaaggtg gataacgccc tccaatcggg taactcccag       480

gagagtgtca cagagcagga cagcaaggac agcacctaca gcctcagcag caccctgacg       540

ctgagcaaag cagactacga gaaacacaaa gtctacgcct gcgaagtcac ccatcagggc       600

ctgagctcgc ccgtcacaaa gagcttcaac aggggagagt gttag                       645
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<210> 34
<211> 7
<212> PRT
<213> TNF-alpha light chain

<400> 34
Asp Ile Gln Met Thr Gln Ser
  1   5

13

<210>   35
<211>   8
<212>   PRT
<213>   TNF-alpha heavy chain

<400>   35
Glu Val Gln Leu Glu Val Asp Ser
    1   5

<210>   36
<211>   12
<212>   PRT
<213>   N-terminal sequence of recombinant TNF-alpha

<400>   36
Asp Glu Ile Val Gln Met Leu Thr Val Gln Asp Ser
    1   5   10